Outcomes of Very Preterm Infants Receiving Prostaglandin (PGE1) for Duct-Dependent Congenital Heart Disease

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BACKGROUND

Infants with duct-dependent congenital heart disease (DD-CHD) may be born very preterm (<32 weeks' gestation).

These infants may require prolonged infusions of prostaglandin (PGE1) to maintain ductal patency, whilst attaining sufficient weight to undergo cardiac surgery.

Literature on the outcomes of these infants is sparse.

Objective: To describe mortality and morbidity of very preterm infants with DD-CHD, treated with PGE1.

METHOD

A retrospective review of very preterm infants born at The Royal Women's Hospital, Melbourne, between 2006 and 2016 with DD-CHD, treated with PGE1.

RESULTS

18 infants were identified, with 2 excluded for the following reasons:

- 1 infant commenced PGE1 at 66 days for evolving coarctation
- 1 infant had a structurally normal heart

Table 1. Infant characteristics

Characteristics	
Gestational age at birth, weeks + days, median (IQR)	30+3 (29+6 to 31+2)
Birth weight, grams, median (IQR)	1275 (1070 to 1480)
Male	8 (50%)
Multiple pregnancy	11 (69%)
Indication for delivery	
Spontaneous preterm labour	5 (31%)
Non-reassuring CTG	8 (50%)
Prolonged rupture of membranes	2 (13%)
Suspected chorioamnionitis	2 (13%)
Complication of twin pregnancy	2 (13%)
Exposed to antenatal glucocorticoids	14 (88%)
Labour prior to delivery	5 (31%)
Caesarean section	14 (88%)
Antenatal diagnosis of cardiac anomaly	13 (81%)
Final cardiac diagnosis	
Duct dependent-pulmonary circulation	9 (56%)
Duct dependent-systemic circulation	5 (31%)
Transposition of the great arteries	2 (13%)

Table 2. Outcomes

Outcomes	
PGE1 usage	
Age commenced, days, median (IQR)	1 (1 to 1)
Duration, days, median (IQR)	23 (8 to 47)
Maximum dose, ng/kg/min, median (IQR)	15 (10 to 22)
Pre-cardiac surgery	
<u>Caffeine</u>	
Before 24 hours of age	10 (63%)
During PGE treatment	14 (88%)
Duration, days, median (IQR)	39 (28 to 50)
<u>Respiratory Support</u>	
Mechanical ventilation	12 (75%)
Non-invasive respiratory support	16 (100%)
Supplemental oxygen	16 (100%)
<u>Inotropes</u>	
Received	10 (63%)
Duration, days, median (IQR)	4 (3 to 7)
<u>Central Lines</u>	
UAC	7 (44%)
UVC	10 (63%)
No central line	5 (31%)
<u>Nutrition</u>	
Fed whilst receiving PGE1	10 (63%)
Maximum feeds whilst receiving PGE1, ml/kg/day, median (IQR)	77 (37 to 179)
Intravenous nutrition	15 (94%)
Duration of IV nutrition, days, median (IQR)	21 (9 to 41)
Surgery	
Chronological age, days, median (IQR)	50 (16 to 64)
Postmenstrual age, weeks + day, median (IQR)	36+6 (32+3 to 39+0)
Weight, grams, median (IQR)	1987 (1412 to 2571)
Comorbidities	
Necrotising enterocolitis	5 (31%)
Retinopathy of prematurity needing treatment	1 (6%)
Chronic lung disease	7 (44%)
Any cranial ultrasound abnormality	9 (56%)
Mortality	
Pre-cardiac surgery	1 (6%)
Post-cardiac surgery	3 (19%)
Cardiac anomaly contributing cause	4 (100%)
Discharge	
Age, days, median (IQR)	83 (72 to 101)
Weight, grams, median (IQR)	2865 (2615 to 3163)

Conclusions

Very preterm infants with DD-CHD have substantial morbidity and mortality. These findings are important for clinicians to understand, particularly when counselling parents of these high-risk infants.